

# A Novel Artemisinin-Based Nanodrug for the Treatment of Pancreatic Cancer

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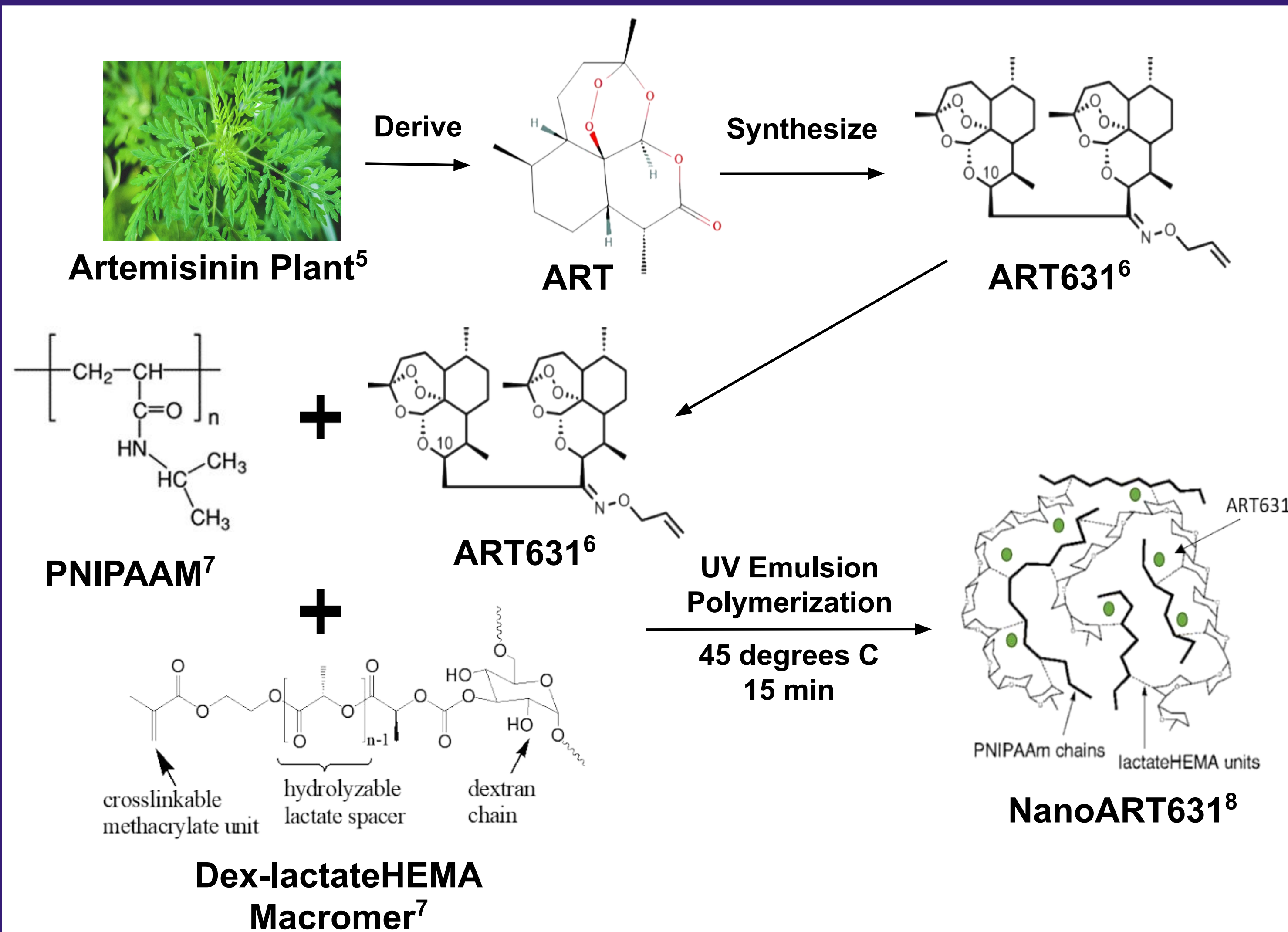
## Introduction

- Five year survival rate is for pancreatic cancer is 5%<sup>1</sup>
- Drawbacks of current treatments include short drug half life, poor drug solubility, and low bioavailability
- Artemisinin generates free radical species within cells causing structural damage to mRNA and DNA leading to apoptosis<sup>2</sup>
- Artemisinin preferentially acts on cells with high metabolic activity, limiting healthy cell damage<sup>3</sup>
- Nanogels allow for targeted treatment and release of drugs in a controlled manner<sup>4</sup>

## Research Question

Is NanoART631 an effective chemotherapeutic agent against Pancreatic Cancer?

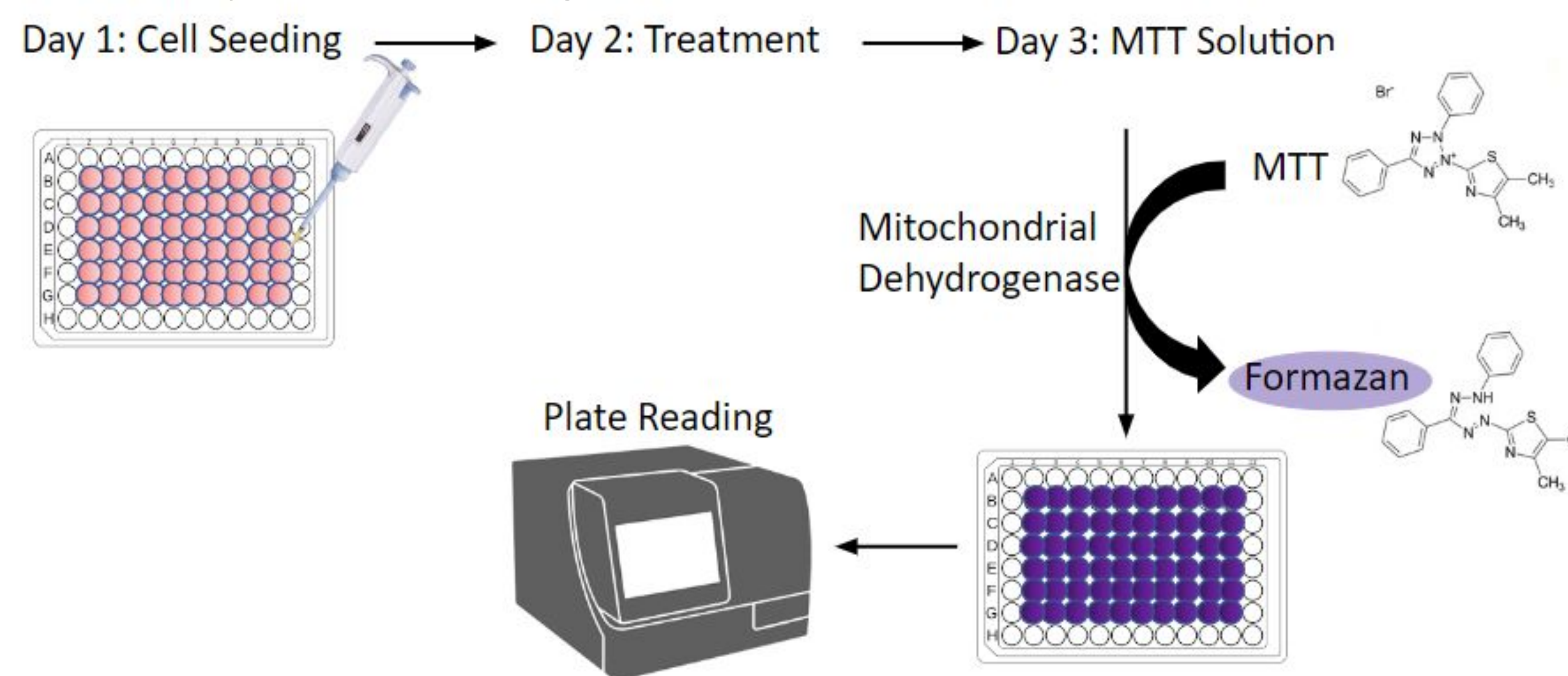
## Experimental Design



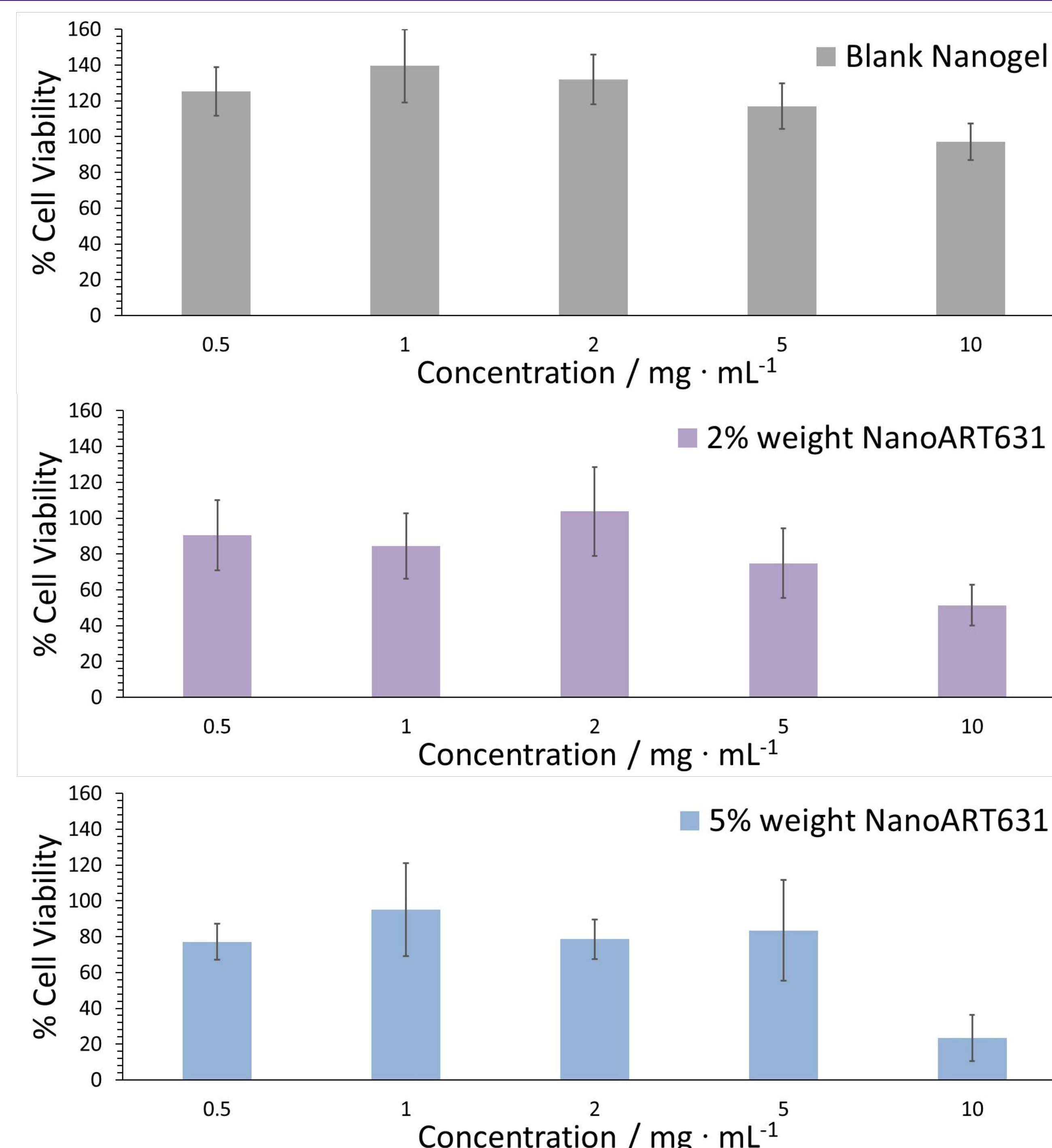
- Improves water solubility of ART631<sup>4</sup>
- Enhances half life of ART631<sup>4</sup>
- Increases bioavailability of ART631<sup>4</sup>

## Methods

- Perform MTT with blank Nanogel and NanoART631
- Determine IC50 from MTT studies to use for time-dependent studies to measure the half life and potency of the drug



## Cytotoxicity of NanoART631

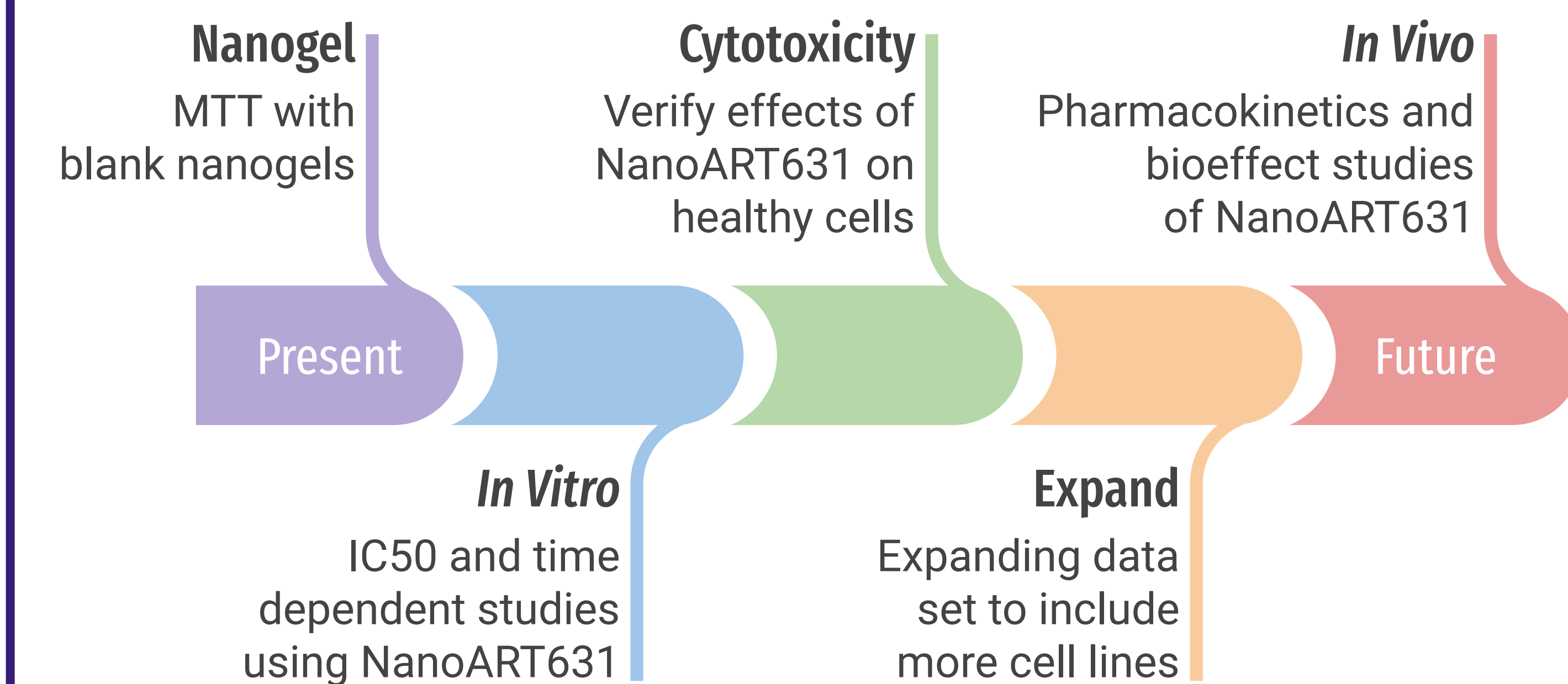


Cytotoxicity of NanoART631 for PANC-1 pancreatic cancer cells as measured by MTT assay. Analysis run with blank nanogel and NanoART631 at 2% weight and 5% weight.

## Summary

- Blank nanogels are not cytotoxic to PANC-1
- The loaded nanogel (NanoART631) results in a loss of cell viability as concentration increases
- NanoART631 kills over 50% of the cells when concentration reaches 10mg/mL
- NanoART631 more effective against PANC-1 cells with increased ART content within the gels

## Future Directions



- MTT: Artemisinin alone and healthy pancreatic cells
- TEM and flow cytometry to measure cell uptake
- Animal models to study pharmacokinetics and bioeffects of NanoART631
- Investigate NanoART631 with other cancer types

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References

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